

CLAIMS

1. A coating composition comprising a partial hydrolyzate of a metallic compound having a hydrolyzable reaction site.

2. The coating composition according to claim 1, wherein the partial hydrolyzate has been prepared by hydrolyzing a metallic compound having a hydrolyzable reaction site in the presence of water in not more than stoichiometric amount relative to the hydrolyzable reaction site.

3. The coating composition according to claim 1, wherein the partial hydrolyzate comprises a sol solution prepared from

(1) a metallic compound having a hydrolyzable reaction site,

(2) an additive which can function to dissolve or disperse the metallic compound in a solvent and to permit the hydrolysis of the metallic compound to proceed in a rate-controlling manner,

(3) water in not more than stoichiometric amount relative to the hydrolyzable reaction site, and

(4) an organic solvent.

4. A coating composition prepared from

(1) a metallic compound having a hydrolyzable reaction site,

(2) an additive which can function to dissolve or disperse the metallic compound in an organic solvent and to permit the hydrolysis of the metallic compound to proceed in a rate-controlling manner, and

(3) an organic solvent.

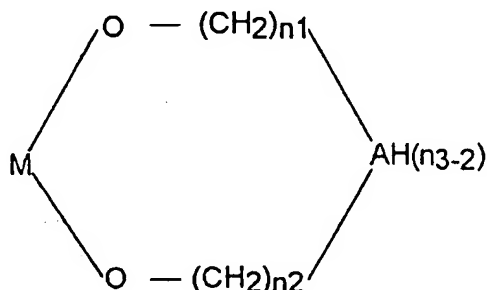
5. The coating composition according to claim 1, 2, 3 or 4, wherein the metallic compound having a hydrolyzable reaction site is at least one metal alkoxide, preferably an alkaline earth metal alkoxide.

6. The coating composition according to claim 1, 2, 3, 4 or 5, wherein the metallic compound having a

hydrolyzable reaction site is a magnesium alkoxide.

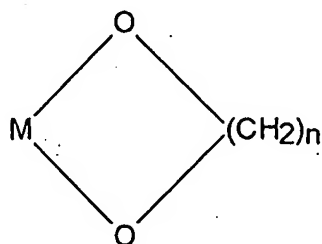
7. The coating composition according to claim 3, 4, 5 or 6, wherein the additive is at least one member selected from a carboxylic acid, a carboxylic acid derivative, an alkanolamine compound, a glycol compound, a glycol derivative, and an organic compound having a carbon-carbon triple bond.

8. The coating composition according to claim 1, 2, 3 or 4, wherein the partial hydrolyzate is represented by the following structural formula:



wherein M represents an alkaline earth metal atom, A represents a hetero atom, $n1$ and $n2$ are each an integer of 1 or more, and $n3$ is a valence of the hetero atom.

9. The coating composition according to claim 1, 2, 3 or 4, wherein the partial hydrolyzate is represented by the following structural formula:



wherein M represents an alkaline earth metal atom and n is an integer of 1 or more.

10. The coating composition according to any one of claims 1 to 9, which further comprises a hydrolysis catalyst.

11. The coating composition according to 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10, which further comprises a thickener.

12. A process for producing a coating composition comprising the steps of:

(1) adding a metallic compound having a hydrolyzable reaction site and an additive, which can function to dissolve or disperse the metallic compound in an organic solvent and to permit the hydrolysis of the metallic compound to proceed in a rate-controlling manner, to an organic solvent to dissolve or disperse the metallic compound therein;

(2) adding water in not more than stoichiometric amount relative to the hydrolyzable reaction site to the resultant solution or dispersion to partially hydrolyze the metallic compound; and

(3) maturing the partial hydrolyzate solution to grow particles of a metal oxide and/or a metal hydroxide, thereby preparing a stable sol solution.

13. A process for producing a coating composition, comprising the steps of:

(1) adding at least one compound, selected from a carboxylic acid, a carboxylic acid derivative, an alkanolamine compound, a glycol compound, a glycol derivative, and an organic compound having a carbon-carbon triple bond, and an alkaline earth metal alkoxide, preferably a magnesium alkoxide, to an organic solvent to dissolve or disperse the alkaline earth metal alkoxide therein;

(2) adding water in not more than stoichiometric amount relative to the alkoxyl group of the alkaline earth metal alkoxide to the resultant solution or dispersion to partially hydrolyze the alkaline earth metal alkoxide; and

(3) maturing the partial hydrolyzate solution to grow particles of an alkaline earth metal hydroxide to prepare a stable sol solution.

14. A process for producing a functional film, comprising the step of: coating a coating composition according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11 on a substrate to form a functional film.

15. A process for producing a functional film, comprising the steps of: coating a coating composition according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11 on a substrate and heating the coating to form a functional film.

16. A functional film produced by a process according to claim 14 or 15.

17. The functional film according to claim 15, wherein the functional film is a protective layer for a plasma display.

18. An alternating current type plasma display comprising: a back substrate and a front substrate provided so as to face each other with a gas discharge space sandwiched between the back and front substrates; a pair of electrodes, covered with a dielectric layer, provided on one or both of the substrates; and a protective layer provided on the dielectric layer, the protective layer being produced by coating a coating liquid, substantially containing a partial hydrolyzate derived from an alkaline earth metal compound having a hydrolyzable reaction site, on a dielectric layer provided on a substrate and heating the coating.

19. The alternating current type plasma display according to claim 18, wherein the partial hydrolyzate is prepared substantially from a composition comprising

(1) an alkaline earth metal compound having a hydrolyzable reaction site,

(2) an additive which can function to dissolve or disperse the alkaline earth metal compound in a solvent and to permit the hydrolysis of the alkaline earth metal compound to proceed in a rate-controlling manner,

(3) water in not more than stoichiometric amount relative to the hydrolyzable reaction site, and

(4) an organic solvent.

20. An alternating plasma display comprising: a back substrate and a front substrate provided so as to face each other with a gas discharge space sandwiched between the

back and front substrates; a pair of electrodes, covered with a dielectric layer, provided on one or both of the substrates; and a protective layer provided on the dielectric layer, the protective layer comprising an alkaline earth metal oxide film formed by coating a coating liquid, substantially containing a partial hydrolyzate prepared from a composition comprising

(1) an alkaline earth metal compound having a hydrolyzable reaction site,

(2) an additive which can function to dissolve or disperse the alkaline earth metal compound in an organic solvent and to permit the hydrolysis of the alkaline earth metal compound to proceed in a rate-controlling manner, and

(3) an organic solvent,
on a dielectric layer provided on a substrate and heating the coating.

21. The alternating current type plasma display according to any one of claims 18 to 20, wherein the alkaline earth metal compound having a hydrolyzable reaction site is at least one member selected from an organic compound of magnesium and an inorganic compound of magnesium.

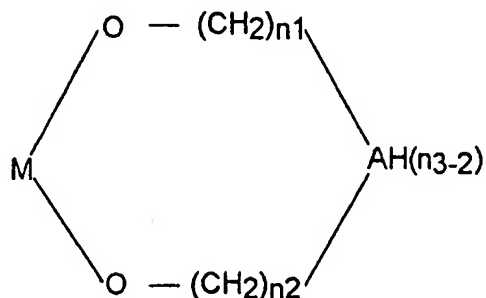
22. The alternating plasma display according to claim 21, wherein the organic compound of magnesium is magnesium alkoxide.

23. The alternating plasma display according to any one of claims 18 to 22, wherein the alkaline earth metal oxide film is formed of magnesium oxide particles having a diameter of not more than 0.3 μm .

24. The alternating plasma display according to any one of claims 19 to 23, wherein the additive is at least one member selected from a carboxylic acid, a carboxylic acid derivative, an alkanolamine compound, a glycol compound, a glycol derivative, and an organic compound having a carbon-carbon triple bond.

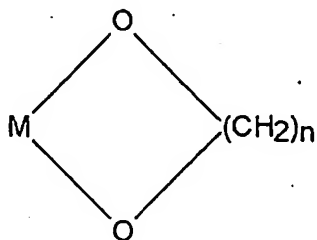
25. The alternating plasma display according to any one of claims 18 to 24, wherein the partial hydrolyzate

derived from the alkaline earth metal compound is represented by the following structural formula:



wherein M represents an alkaline earth metal atom, A represents a hetero atom, $n1$ and $n2$ are an integer of 1 or more, and $n3$ is a valence of the hetero atom.

26. The alternating current type plasma display according to any one of claims 18 to 24, wherein the partial hydrolyzate of the alkaline earth metal compound is represented by the following structural formula:



wherein M represents an alkaline earth metal atom and n is an integer of 1 or more.

27. A process for producing an alternating current type plasma display according to any one of claims 18 to 26, comprising the steps of: coating a coating liquid, containing a partial hydrolyzate derived from an alkaline earth metal compound, on a dielectric layer provided on a substrate and heating the coating to form a protective layer of an alkaline earth metal oxide film.